

## CLAIMS

1. A downhill speed control system having control means (100) for controlling the strength of applied brake to make an actual vehicle speed matched with a target speed when a vehicle runs down a slope, wherein:

the control system includes target speed setting means (50A, 50B) capable of setting the target speed, and

said control means (100) controls the strength of applied brake so that an actual vehicle speed is matched with a target speed set by said target speed setting means (50A, 50B).

2. A downhill speed control system according to Claim 1, wherein:

said target speed setting means (50A) includes a setting selection switch capable of selecting a plurality of target speeds set in advance.

3. A downhill speed control system according to Claim 1, wherein:

said target speed setting means (50B) includes a setting speed switch capable of setting the target speed in a continuous way.

4. A downhill speed control system according to Claim 2 or 3, wherein:

said target speed setting means (50B) includes an

up/down switch (50C) capable of increasing and decreasing the target speed indicated on a display.

5. A downhill speed control system according to Claim 1, wherein:

said control means (100) monitors a step-down amount of an accelerator pedal and starts control of the strength of the applied brake when the step-down amount becomes zero.

6. A downhill speed control system according to Claim 1, wherein:

said control means (100) monitors a step-down amount of an accelerator pedal or a step-down amount of a brake pedal and varies a brake control amount depending on the step-down amount.

7. A downhill speed control system according to Claim 1, further comprising:

downslope gradient angle setting means (50XB) capable of changeably setting a gradient angle of a downward slope,

wherein said control means (100) modifies at least one control constant for control control, which is executed on a difference between the target speed and the actual speed, depending on the gradient angle set by said downslope gradient angle setting means (50XB), thereby controlling the strength of the applied brake.

8. A downhill speed control system according to Claim 1,

further comprising:

load setting means (50XC) capable of changeably setting a load carried on a vehicle,

wherein said control means (100) modifies at least one control constant for control control, which is executed on a difference between the target speed and the actual speed, depending on the load set by said load setting means (50XC), thereby controlling the strength of the applied brake.

9. A downhill speed control system according to Claim 7, wherein:

said control means (100) adds an offset output value, which is supplied to a solenoid proportional valve for driving each brake, to a value computed with said control control depending on the gradient angle set by said downslope gradient angle setting means (50XB), thereby controlling the strength of the applied brake.

10. A downhill speed control system according to Claim 8, wherein:

said control means (100) adds the offset output value, which is supplied to the solenoid proportional valve for driving each brake, to a value computed with said control control depending on the load set by said load setting means (50XC), thereby controlling the strength of the applied brake.

11. A downhill speed control system according to Claim 1,

wherein:

said control means (100) computes an acceleration based on the actual vehicle speed, and performs control to increase the strength of the applied brake when the computed acceleration is larger than a target acceleration set in advance.

12. A downhill speed control system according to Claim 11, wherein:

said control means (100) has means (120Y) for executing controls including proportional control to control the strength of the applied brake depending on a difference between the actual vehicle speed and the target speed when said vehicle runs down the slope, and

a proportional constant for use in the proportional control executed by said control means (120Y) is increased when the computed acceleration is larger than the target acceleration set in advance.

13. A downhill speed control system according to Claim 1, wherein:

said control means (100) sets control parameters corresponding to a previously taught condition of a downward slope and controls the strength of the applied brake in accordance with the set control parameters.

14. A downhill speed control system according to Claim 13, further comprising:

a setting unit (50) for setting the condition of the downward slope, and

a distance sensor (75) for detecting the distance from a slope start point of the downward slope,

wherein said control means (100) holds the condition of the downward slope, which has been set and taught by said setting unit (50) in advance, in correspondence with the distance from the slope start point detected by said distance sensor (75), and while reproducing the condition of the downward slope held in correspondence with the distance from the slope start point detected by said distance sensor (75), said control means sets the control parameters corresponding to the reproduced condition of the downward slope, thereby controlling the strength of the applied brake in accordance with the set control parameters.

15. A downhill speed control system according to Claim 13, further comprising:

a condition detecting sensor (80, 85) for detecting the condition of the downward slope, and

a distance sensor (75) for detecting the distance from a slope start point of the downward slope,

wherein said control means (100A) holds the condition of the downward slope, which has been set and taught by said condition detecting sensor (80, 85) in advance, in correspondence with the distance from the slope start point detected by said distance sensor (75), and while reproducing the condition of the downward slope held in correspondence

with the distance from the slope start point detected by said distance sensor (75), said control means sets the control parameters corresponding to the reproduced condition of the downward slope, thereby controlling the strength of the applied brake in accordance with the set control parameters.

16. A downhill speed control system according to Claim 13, further comprising:

a condition detecting sensor (80, 85) for detecting the condition of the downward slope, and

a position sensor (90) for detecting a position in the course of the downward slope,

wherein said control means (100B) holds the condition of the downward slope, which has been set and taught by said condition detecting sensor (80, 85) in advance, in correspondence with the position in the course of the downward slope detected by said position sensor (90), and while reproducing the condition of the downward slope held in correspondence with the position in the course of the downward slope detected by said position sensor (90), said control means sets the control parameters corresponding to the reproduced condition of the downward slope, thereby controlling the strength of the applied brake in accordance with the set control parameters.

17. A downhill speed control system according to Claim 13, further comprising:

a receiver for receiving the condition of the downward slope from a road marker which transmits the condition of the downward slope,

wherein said control means (100C) receives, by said receiver, the condition of the downward slope, which has been set and taught in said road marker in advance, and sets the control parameters corresponding to the received condition of the downward slope, thereby controlling the strength of the applied brake in accordance with the set control parameters.

18. A downhill speed control system according to Claim 13, wherein:

the condition of the downward slope is a steering angle in the downward slope, and

said control means (100) sets the target speed as one of the control parameters corresponding to the steering angle in the downward slope, thereby controlling the strength of the applied brake so that a downhill speed is matched with the set target speed.

19. A downhill speed control system according to Claim 13, wherein:

the condition of the downward slope is a gradient angle of the downward slope, and

said control means (100) sets a control constant as one of the control parameters corresponding to the gradient angle of the downward slope, thereby controlling the

strength of the applied brake.

20. A downhill speed control system according to Claim 13, wherein:

the condition of the downward slope is a gradient angle of the downward slope, and

said control means (100) sets an offset output value for a proportional valve, as one of the control parameters, corresponding to the gradient angle of the downward slope, thereby controlling the strength of the applied brake.

21. A downhill speed control system having control means for controlling the strength of applied brake to make an actual vehicle speed matched with a target speed when a vehicle runs down a slope, wherein:

said control means (100) sets control parameters corresponding to a previously taught condition of a downward slope, and controls the strength of applied brake in accordance with the set control parameters.

22. A downhill speed control system according to Claim 21, further comprising:

a setting unit (50) for setting the condition of the downward slope, and

a distance sensor (75) for detecting the distance from a slope start point of the downward slope,

wherein said control means (100) holds the condition of the downward slope, which has been set and taught by said



setting unit in advance, in correspondence with the distance from the slope start point detected by said distance sensor, and while reproducing the condition of the downward slope held in correspondence with the distance from the slope start point detected by said distance sensor, said control means sets the control parameters corresponding to the reproduced condition of the downward slope, thereby controlling the strength of the applied brake in accordance with the set control parameters.

23. A downhill speed control system according to Claim 21, further comprising:

a condition detecting sensor (80, 85) for detecting the condition of the downward slope, and

a distance sensor (75) for detecting the distance from a slope start point of the downward slope,

wherein said control means (100A) holds the condition of the downward slope, which has been set and taught by said condition detecting sensor (80, 85) in advance, in correspondence with the distance from the slope start point detected by said distance sensor (75), and while reproducing the condition of the downward slope held in correspondence with the distance from the slope start point detected by said distance sensor (75), said control means sets the control parameters corresponding to the reproduced condition of the downward slope, thereby controlling the strength of the applied brake in accordance with the set control parameters.

24. A downhill speed control system according to Claim 21, further comprising:

a condition detecting sensor (80, 85) for detecting the condition of the downward slope, and

a position sensor (90) for detecting a position in the course of the downward slope,

wherein said control means (100B) holds the condition of the downward slope, which has been set and taught by said condition detecting sensor (80, 85) in advance, in correspondence with the position in the course of the downward slope detected by said position sensor (90), and while reproducing the condition of the downward slope held in correspondence with the position in the course of the downward slope detected by said position sensor (90), said control means sets the control parameters corresponding to the reproduced condition of the downward slope, thereby controlling the strength of the applied brake in accordance with the set control parameters.

25. A downhill speed control system according to Claim 21, further comprising:

a receiver (95) for receiving the condition of the downward slope from a road marker which transmits the condition of the downward slope,

wherein said control means (100) receives, by said receiver (95), the condition of the downward slope, which has been set and taught in said road marker in advance, and

sets the control parameters corresponding to the received condition of the downward slope, thereby controlling the strength of the applied brake in accordance with the set control parameters.

26. A downhill speed control system according to Claim 21, wherein:

the condition of the downward slope is a steering angle in the downward slope, and

said control means (100) sets the target speed as one of the control parameters corresponding to the steering angle in the downward slope, thereby controlling the strength of the applied brake so that a downhill speed is matched with the set target speed.

27. A downhill speed control system according to Claim 21, wherein:

the condition of the downward slope is a gradient angle of the downward slope, and

said control means (100) sets a control constant as one of the control parameters corresponding to the gradient angle of the downward slope, thereby controlling the strength of the applied brake.

28. A downhill speed control system according to Claim 21, wherein:

the condition of the downward slope is a gradient angle of the downward slope, and

said control means (100) sets an offset output value for a proportional valve, as one of the control parameters, corresponding to the gradient angle of the downward slope, thereby controlling the strength of the applied brake.